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International application number: PCT/GB04/005125

International filing date: 06 December 2004 (06.12.2004)

Document type: Certified copy of priority document

Document details: Country/Office: GB
Number: 0329247.1
Filing date: 18 December 2003 (18.12.2003)

Date of receipt at the International Bureau: 20 January 2005 (20.01.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)

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2. Patent application number *(The Patent Office will fill in this part)*	0329247.1 — 18 DEC 2003
3. Full name, address and postcode of the or of each applicant *(underline all surnames)*	Avecia Limited Hexagon House Blackley Manchester, M9 8ZS United Kingdom
Patents ADP number *(if you know it)*	07764137001
If the applicant is a corporate body, give the country/state of its incorporation	GB
4. Title of the invention	Compounds and Inks
5. Name of your agent *(if you have one)*	MORPETH, Fraser Forrest
"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*	Avecia Limited Hexagon House Blackley Manchester, M9 8ZS United Kingdom
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COMPOUNDS AND INKS

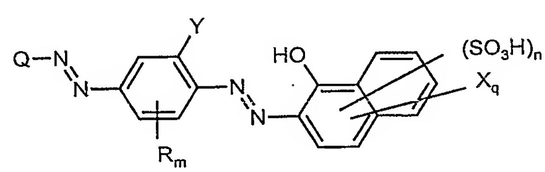
This invention relates to compounds suitable for use as dyes, inks, printing processes, printed substrates and ink-jet printer cartridges.

Ink-jet printing is a non-impact printing technique in which droplets of ink are ejected through a fine nozzle onto a substrate without bringing the nozzle into contact with the substrate. The set of inks used in this technique typically comprise yellow, magenta, cyan and black inks.

While ink-jet printers have many advantages over other forms of printing and image development there are still technical challenges to be addressed. For example, there are the contradictory requirements of providing ink colorants that are soluble in the, usually aqueous, ink medium and yet do not run or smudge excessively when printed on paper. The inks need to dry quickly to avoid sheets sticking together after they have been printed, but they should not form a crust over the tiny nozzle used in the printer. Storage stability is also important to avoid particle formation that could block the tiny nozzles used in the printer. Furthermore, the resultant images desirably do not fade rapidly on exposure to light or common oxidising gases such as ozone.

With the advent of high-resolution digital cameras it is becoming increasingly common to use ink jet printers to print photographs. This avoids the expense of conventional silver halide photography and provides a print quickly. However consumers expect that the print so produced will not fade or change colour with time. Most of the colorants currently used in ink-jet printing fail to provide satisfactory performance versus silver halide photography.

The present invention provides a compound of Formula (1) and salts thereof:



Formula (1)

wherein:

Q is an optionally substituted aryl ring;

Y is CO_2H, SO_3H or PO_3H_2;

R and X are substituents;

m is 0 to 3;

n is 0 to 6; and

q is 0 to 6.

Preferably Q is optionally substituted naphthyl or optionally substituted phenyl, more preferably optionally substituted phenyl.

It is particularly preferred that Q is phenyl bearing at least one CO_2H, SO_3H or PO_3H_2 substituent and optionally other substituents.

It is especially preferred that Q is phenyl with 1 or 2 substituents independently selected from the group consisting of CO_2H, SO_3H or PO_3H_2.

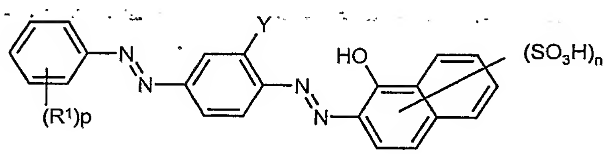
R, X and optional substituents on Q are preferably independently selected from: optionally substituted alkyl (preferably C_{1-4}-alkyl), optionally substituted alkenyl (preferably C_{1-4}-alkenyl), optionally substituted alkynyl (preferably C_{1-4}-alkynyl), optionally substituted alkoxy (preferably C_{1-4}-alkoxy), optionally substituted aryl (preferably phenyl), optionally substituted aryloxy (preferably phenoxy), optionally substituted heterocyclyl, polyalkylene oxide (preferably polyethylene oxide or polypropylene oxide), CO_2H, SO_3H, PO_3H_2, nitro, cyano, halo, ureido, $-SO_2F$, hydroxy, ester, $-NR^aR^b$, $-COR^a$, $-CONR^aR^b$, $-NHCOR^a$, carboxyester, sulfone, and $-SO_2NR^aR^b$ wherein R^a and R^b are each independently H or optionally substituted alkyl (especially C_{1-4}-alkyl). Optional substituents for any of the above substituents may be selected from the same list of substituents.

Preferably n is 1, 2 or 3, more preferably 2 or 3.

Preferably m is 0.

Preferably q is 0 or 1.

Preferred compounds of Formula (1) are of Formula (2);



Formula (2)

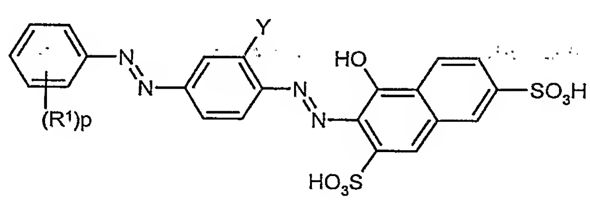
wherein:

Y and R^1 independently are CO_2H, SO_3H or PO_3H_2;

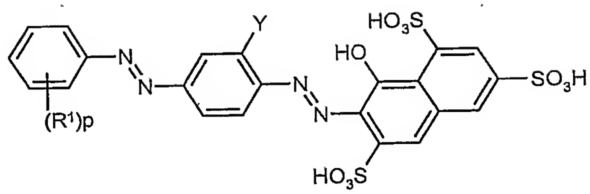
p is 1 or 2; and

n is 1 to 3.

More preferred compounds of Formula (1) are of Formula (3) and Formula (4):



Formula (3)



Formula (4)

wherein

Y and R^1 independently are CO_2H, SO_3H or PO_3H_2; and

p is 1 or 2.

The compounds of Formula (1) are also preferably free from fibre reactive groups. The term fibre reactive group is well known in the art and is described for example in EP 0356014 A1. Fibre reactive groups are capable, under suitable conditions, of reacting with the hydroxyl groups present in cellulosic fibres or with the amino groups present in natural fibres to form a covalent linkage between the fibre and the dye. As examples of fibre reactive groups excluded from the compounds of Formulae (1) there may be mentioned aliphatic sulphonyl groups which contain a sulphate ester group in beta-position to the sulphur atom, e.g. beta-sulphato-ethylsulphonyl groups, alpha, beta-unsaturated acyl radicals of aliphatic carboxylic acids, for example acrylic acid, alpha-chloro-acrylic acid, alpha-bromoacrylic acid, propiolic acid, maleic acid and mono- and dichloro maleic; also the acyl radicals of acids which contain a substituent which reacts with cellulose in the presence of an alkali, e.g. the radical of a halogenated aliphatic acid such as chloroacetic acid, beta-chloro and beta-bromopropionic acids and alpha, beta-dichloro- and dibromopropionic acids or radicals of vinylsulphonyl- or beta-chloroethylsulphonyl- or beta-sulphatoethyl-sulphonyl-endo- methylene cyclohexane carboxylic acids. Other examples of cellulose reactive groups are tetrafluorocyclobutyl carbonyl, trifluoro-cyclobutenyl carbonyl, tetrafluorocyclobutylethenyl carbonyl, trifluoro-cyclobutenylethenyl carbonyl; activated halogenated 1,3-dicyanobenzene radicals; and heterocyclic radicals which contain 1, 2 or 3 nitrogen atoms in the heterocyclic ring and at least one cellulose reactive substituent on a carbon atom of the ring.

Many of the compounds described above may exist in the form of a salt. These salts are included within the scope of the present inventions.

The compounds described above may be converted to the salt form using known techniques.

Preferred salts are alkali metal salts, especially lithium, sodium and potassium, ammonium or a substituted ammonium salt (including a quaternary ammonium salt such as $((CH_3)_4N^+)$ or a mixture thereof. Especially preferred are salts with sodium, lithium, ammonia and volatile amines, more especially sodium salts.

The compounds described herein may exist in tautomeric forms other than those shown in this specification. These tautomers are also included within the scope of the present inventions.

The compounds described herein may also form metal complexes and these complexes are also included within the scope of the present inventions.

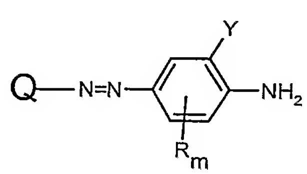
The metal in the metal complex is preferably a transition metal and more preferably is selected from nickel, cobalt, copper, zinc and chromium, particularly Ni^{2+}.

Metal complexes of the compounds described in this invention are preferably 1:1, 2:2 or 2:1, compound to metal. When the complex comprises more than one compound according to the present then the compound may be the same or different.

The metal complexes may also comprise 1 or more additional ligands. These ligands may be coloured or colourless and when there is more than 1 additional ligand they may be the same or different.

The compounds of the invention may be prepared using conventional techniques for the preparation of azo dyes, these methods are summarised in "Organic Chemistry in Colour"; Gordon, P.F. and Gregory, P; Springer-Verlag; pp 57-63: which is incorporated herein by reference.

For example a compound of Formula (1) may be prepared by diazotising an amine of Formula (5):



Formula (5)

wherein:

Q is an optionally substituted aryl ring;

Y is CO_2H, SO_3H or PO_3H_2;

R is a substituent; and

m is 0 to 3:

and coupling the resultant diazonium salt with a an optionally substituted napth-1-ol.

Some monoazo compounds of Formula (5) are commercially available dyes, for example C.I. Acid Yellow 9. Others may be prepared by diazotising an amine of Formula (6):

$$Q\text{-}NH_2$$

Formula (6)

and coupling the resultant diazonium salt with a compound of Formula (7)

miscible organic solvents include C_{1-6}-alkanols, preferably methanol, ethanol, n-propanol, isopropanol, n-butanol, sec-butanol, tert-butanol, n-pentanol, cyclopentanol and cyclohexanol; linear amides, preferably dimethylformamide or dimethylacetamide; ketones and ketone-alcohols, preferably acetone, methyl ether ketone, cyclohexanone and diacetone alcohol; water-miscible ethers, preferably tetrahydrofuran and dioxane; diols, preferably diols having from 2 to 12 carbon atoms, for example pentane-1,5-diol, ethylene glycol, propylene glycol, butylene glycol, pentylene glycol, hexylene glycol and thiodiglycol and oligo- and poly-alkyleneglycols, preferably diethylene glycol, triethylene glycol, polyethylene glycol and polypropylene glycol; triols, preferably glycerol and 1,2,6-hexanetriol; mono-C_{1-4}-alkyl ethers of diols, preferably mono-C_{1-4}-alkyl ethers of diols having 2 to 12 carbon atoms, especially 2-methoxyethanol, 2-(2-methoxyethoxy)ethanol, 2-(2-ethoxyethoxy)-ethanol, 2-[2-(2-methoxyethoxy)ethoxy]ethanol, 2-[2-(2-ethoxyethoxy)-ethoxy]-ethanol and ethyleneglycol monoallylether; cyclic amides, preferably 2-pyrrolidone, N-methyl-2-pyrrolidone, N-ethyl-2-pyrrolidone, caprolactam and 1,3-dimethylimidazolidone; cyclic esters, preferably caprolactone; sulphoxides, preferably dimethyl sulphoxide and sulpholane. Preferably the liquid medium comprises water and 2 or more, especially from 2 to 8, water-miscible organic solvents.

Especially preferred water-miscible organic solvents are cyclic amides, especially 2-pyrrolidone, N-methyl-pyrrolidone and N-ethyl-pyrrolidone; diols, especially 1,5-pentane diol, ethyleneglycol, thiodiglycol, diethyleneglycol and triethyleneglycol; and mono- C_{1-4}-alkyl and C_{1-4}-alkyl ethers of diols, more preferably mono- C_{1-4}-alkyl ethers of diols having 2 to 12 carbon atoms, especially 2-methoxy-2-ethoxy-2-ethoxyethanol.

Examples of further suitable liquid media comprising a mixture of water and one or more organic solvents are described in US 4,963,189, US 4,703,113, US 4,626,284 and EP 4,251,50A.

When the liquid medium comprises an organic solvent free from water, (i.e. less than 1% water by weight) the solvent preferably has a boiling point of from 30° to 200°C, more preferably of from 40° to 150°C, especially from 50 to 125°C. The organic solvent may be water-immiscible, water-miscible or a mixture of such solvents. Preferred water-miscible organic solvents are any of the hereinbefore-described water-miscible organic solvents and mixtures thereof. Preferred water-immiscible solvents include, for example, aliphatic hydrocarbons; esters, preferably ethyl acetate; chlorinated hydrocarbons, preferably CH_2Cl_2; and ethers, preferably diethyl ether; and mixtures thereof.

When the liquid medium comprises a water-immiscible organic solvent, preferably a polar solvent is included because this enhances solubility of the compound in the liquid medium. Examples of polar solvents include C_{1-4}-alcohols.

In view of the foregoing preferences it is especially preferred that where the liquid medium is an organic solvent free from water it comprises a ketone (especially methyl ethyl ketone) &/or an alcohol (especially a C_{1-4}-alkanol, more especially ethanol or propanol).

The organic solvent free from water may be a single organic solvent or a mixture of two or more organic solvents. It is preferred that when the medium is an organic solvent free from water it is a mixture of 2 to 5 different organic solvents. This allows a medium to be selected that gives good control over the drying characteristics and storage stability of the ink.

Liquid media comprising an organic solvent free from water are particularly useful where fast drying times are required and particularly when printing onto hydrophobic and non-absorbent substrates, for example plastics, metal and glass.

The liquid media may also contain additional components conventionally used in ink-jet printing inks, for example viscosity and surface tension modifiers, corrosion inhibitors, biocides, kogation reducing additives and surfactants which may be ionic or non-ionic.

Although not usually necessary, further colorants may be added to the composition to modify the shade and performance properties. Examples of such colorants include C.I. Acid Red 52, 289; C.I. Direct Yellow 86, 132, 142 and 173; C.I. Direct Blue 199, and 307; C.I. Food Black 2; C.I. Direct Black 168 and 195; C.I. Acid Yellow 23; and any of the dyes used in ink-jet printers sold by Seiko Epson Corporation, Hewlett Packard Company, Canon Inc. & Lexmark International. Addition of such further dyes can increase overall solubility leading to less kogation (nozzle blockage) for the resultant ink.

Preferably the composition according to the second aspect of the invention is an ink-jet printing ink or a liquid dye concentrate.

Concentrates are useful as a means for transporting colorant and so minimising costs associated with drying the dye and transporting excess liquid.

It is preferred that the composition according to the invention is an ink suitable for use in an ink-jet printer. Ink suitable for use in an ink-jet printer is an ink which is able to repeatedly fire through an ink-jet printing head without causing blockage of the fine nozzles.

Inks suitable for use in an ink-jet printer according to the second aspect of the invention are preferably prepared using high purity ingredients and/or by purifying the composition after it has been prepared. Suitable purification techniques are well known, e.g. ultrafiltration, reverse osmosis, ion exchange and combinations thereof (either before or after they are incorporated in a composition according to the present invention). This purification results in the removal of substantially all of the inorganic salts and by-products resulting from its synthesis. Such purification assists in the preparation of a low viscosity aqueous solution suitable for use in an ink-jet printer.

The inks may be incorporated in an ink-jet printer as a high concentration magenta ink, a low concentration magenta ink or both a high concentration and a low concentration ink. In the latter case this can lead to improvements in the resolution and quality of printed images. Thus the present invention also provides a composition (preferably an ink) where component (a) is present in an amount of 2.5 to 7 parts, more preferably 2.5 to 5

parts (a high concentration ink) or component (a) is present in an amount of 0.5 to 2.4 parts, more preferably 0.5 to 1.5 parts (a low concentration ink).

An ink suitable for use in an ink-jet printer preferably has a viscosity of less than 20 cP, more preferably less than 10 cP, especially less than 5 cP, at 25°C.

An ink suitable for use in an ink-jet printer preferably has a surface tension in the range 20-65 dynes/cm, more preferably in the range 30-60 dynes /cm.

An ink suitable for use in an ink-jet printer preferably contains less than 500ppm, more preferably less than 250ppm, especially less than 100ppm, more especially less than 10ppm in total of divalent and trivalent metal ions (other than any divalent and trivalent metal ions bound to a colorant of Formula (1) or any other component of the ink).

Preferably an ink suitable for use in an ink-jet printer has been filtered through a filter having a mean pore size below 10μm, more preferably below 3μm, especially below 2μm, more especially below 1μm. This filtration removes particulate matter that could otherwise block the fine nozzles found in many ink-jet printers.

Preferably an ink suitable for use in an ink-jet printer contains less than 500ppm, more preferably less than 250ppm, especially less than 100ppm, more especially less than 10ppm in total of halide ions.

A third aspect of the invention provides a process for forming an image on a substrate comprising applying a composition according to the second aspect of the invention thereto by means of an ink-jet printer.

The ink-jet printer preferably applies the composition to the substrate in the form of droplets that are ejected through a small orifice onto the substrate. Preferred ink-jet printers are piezoelectric ink-jet printers and thermal ink-jet printers. In thermal ink-jet printers, programmed pulses of heat are applied to the ink in a reservoir by means of a resistor adjacent to the orifice, thereby causing the ink to be ejected from the orifice in the form of small droplets directed towards the substrate during relative movement between the substrate and the orifice. In piezoelectric ink-jet printers the oscillation of a small crystal causes ejection of the ink from the orifice. Alternately the ink can be ejected by an electromechanical actuator connected to a moveable paddle or plunger, for example as described in International Patent Application WO 00/48938 and International Patent Application WO 00/55089.

The substrate is preferably paper, plastic, textile, metal or glass, more preferably paper, an overhead projector slide or a textile material, especially paper.

Preferred papers are plain, treated or coated papers which may have an acid, alkaline or neutral character.

It is especially preferred that the paper is a photographic quality paper.

A fourth aspect of the present invention provides a substrate, preferably paper, plastic, textile, metal or glass, more preferably paper, an overhead projector slide or a textile material, especially paper more especially plain, coated or treated papers printed with a composition according to the second aspect of the invention, a compound according

to the first aspect of the invention or by means of a process according to third aspect of the invention.

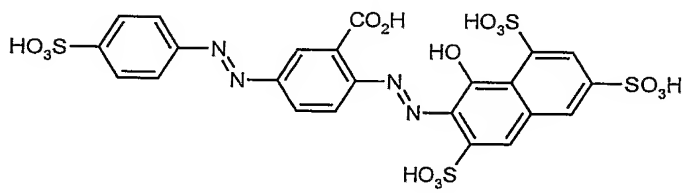
It is especially preferred that the printed substrate paper is a print of a photograph.

A fifth aspect of the present invention provides an ink-jet printer cartridge comprising a chamber and an ink wherein the ink is in the chamber and the ink is as defined in the second aspect of the present invention.

The invention is further illustrated by the following Examples in which all parts and percentages are by weight unless otherwise stated.

Example 1

Preparation of:



Stage 1

Preparation of 2-((sulfomethyl)amino) benzoic acid

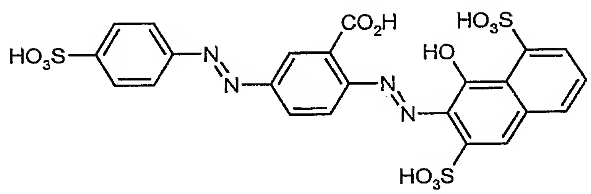
Formaldehyde solution (37%, 31.6g, 0.4mol) and sodium bisulfite (38g, 0.37mol) were dissolved in water (200ml) and the stirred mixture warmed to 60°C. Anthranilic acid (50g, 0.37 mol) was dissolved in water (200ml) at pH 7, and this solution was added to the bisulfite adduct solution, maintaining the temperature at 60-70°C for 2 hours. The reaction mixture was allowed to cool slowly before hydrochloric acid was added to precipitate the product as a white solid. The product was collected by filtration and washed with saturated sodium chloride solution and then acetone. The dried product (34g) contained 22.5% salt.

Stage 2

Preparation of 2-amino-5-((4-sulfophenyl) diazenyl) benzoic acid

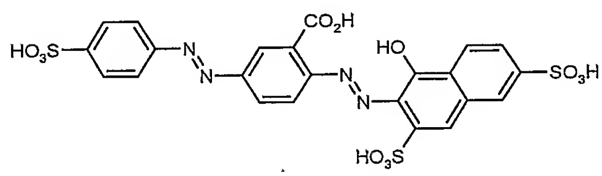
Sulfanilic acid (8.65g, 0.05mol) and sodium nitrite (3.8g) were dissolved in water (pH 8, 100ml). This solution was added to a beaker containing ice (30g) and concentrated hydrochloric acid (15ml). After stirring for 15 minutes, a further aliquot of sulfamic acid (0.5g) was added. This diazonium salt solution was added to a solution of the 2-((sulfomethyl)amino) benzoic acid prepared in stage 1in water (150ml) at 0 to 5°C. The reaction mixture was stirred at 0-5°C for 1.5 hours while the pH of the reaction medium was maintained at pH 4 to 4.5 by the addition of dilute sodium hydroxide solution. When

Example 3
Preparation of:



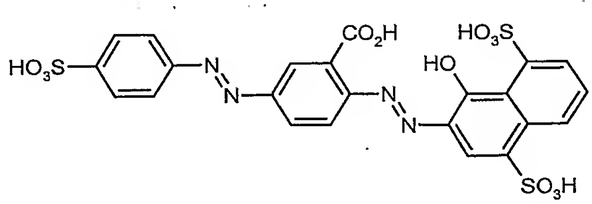
The compound of Example 3 was prepared as described in Example 1 except that in stage 3, 1-hydroxynaphthalene-3,8-disulfonic acid was used in place of 8-hydroxynaphthalene-1,3,6-trisulfonic acid.

Example 4
Preparation of:



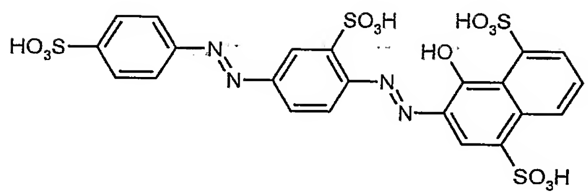
The compound of Example 4 was prepared as described in Example 1 except that in stage 3, 1-hydroxynaphthalene-3,6-disulfonic acid was used in place of 8-hydroxynaphthalene-1,3,6-trisulfonic acid.

Example 5
Preparation of:



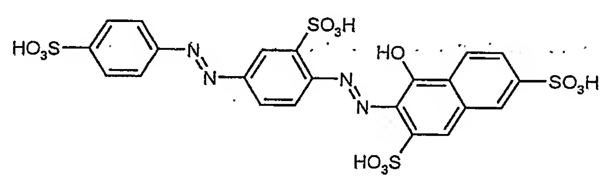
The compound of Example 5 was prepared as described in Example 1 except that in stage 3, 1-hydroxynaphthalene-4,8-disulfonic acid was used in place of 8-hydroxynaphthalene-1,3,6-trisulfonic acid.

Example 6
Preparation of:



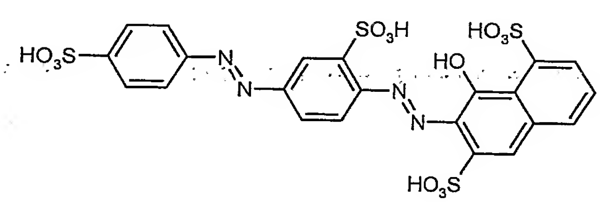
The compound of Example 6 was prepared as described in Example 1, stage 3 except that 4-amino-1,1'-azobenzene-3,4'-disulfonic acid (a compound commercially available from Aldrich Chemicals) was used in place of the product of Example 1, stage 2 and 1-hydroxynaphthalene-4,8-disulfonic acid was used in place of 8-hydroxynaphthalene-1,3,6-trisulfonic acid.

Example 7
Preparation of:



The compound of Example 7 was prepared as described in Example 1, stage 3 except that 4-amino-1,1'-azobenzene-3,4'-disulfonic acid (a compound commercially available from Aldrich Chemical) was used in place of the product of Example 1, stage 2 and 1-hydroxynaphthalene-3,6-disulfonic acid was used in place of 8-hydroxynaphthalene-1,3,6-trisulfonic acid.

Example 8
Preparation of:

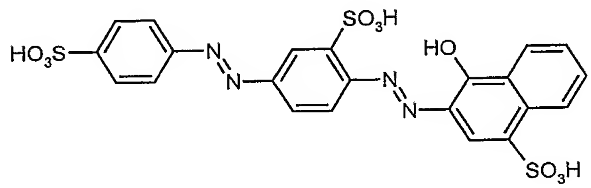


The compound of Example 8 was prepared as described in Example 1, stage 3 except that 4-amino-1,1'-azobenzene-3,4'-disulfonic acid (a compound commercially available from Aldrich Chemical) was used in place of the product of Example 1, stage 2 and 1-

hydroxynaphthalene-3,8-disulfonic acid was used in place of 8-hydroxynaphthalene-1,3,6-trisulfonic acid.

Example 9

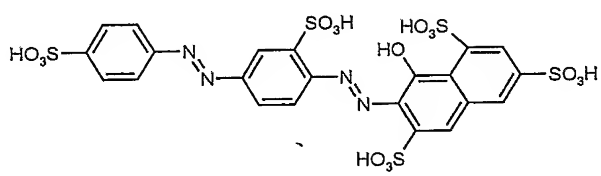
Preparation of:



The compound of Example 9 was prepared as described in Example 1, stage 3 except that 4-amino-1,1'-azobenzene-3,4'-disulfonic acid (a compound commercially available from Aldrich Chemical) was used in place of the product of Example 1, stage 2 and 1-hydroxynaphthalene-4-sulfonic acid was used in place of 8-hydroxynaphthalene-1,3,6-trisulfonic acid.

Example 10

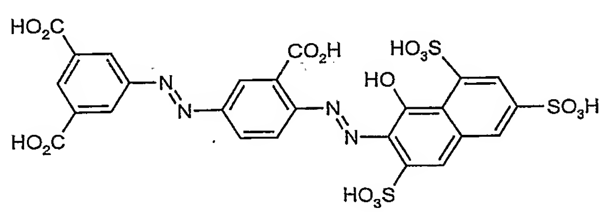
Preparation of:



The compound of Example 10 was prepared as described in Example 1, stage 3 except that 4-amino-1,1'-azobenzene-3,4'-disulfonic acid (a compound commercially available from Aldrich Chemical) was used in place of the product of Example 1, stage 2.

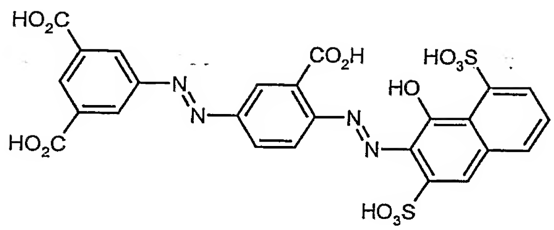
Example 11

Preparation of:



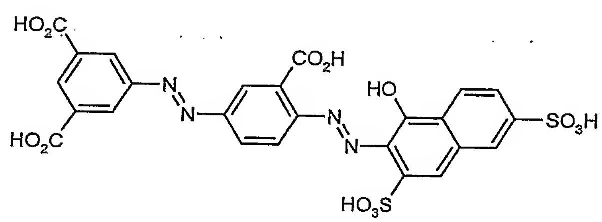
The compound of Example 11 was prepared as described in Example 1 except that in stage 2, 5-aminobenzene-1,3-dicarboxylic acid was used in place of sulfanilic acid.

Example 12
Preparation of:



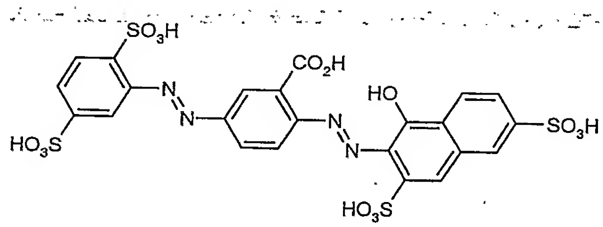
The compound of Example 12 was prepared as described in Example 1 except that in stage 2, 5-aminobenzene-1,3-dicarboxylic acid was used in place of sulfanilic acid and in stage 3, 1-hydroxynaphthalene-3,8-disulfonic acid was used in place of 8-hydroxynaphthalene-1,3,6-trisulfonic acid.

Example 13
Preparation of:



The compound of Example 13 was prepared as described in Example 1 except that in stage 2, 5-aminobenzene-1,3-dicarboxylic acid was used in place of sulfanilic acid and in stage 3, 1-hydroxynaphthalene-3,6-disulfonic acid was used in place of 8-hydroxynaphthalene-1,3,6-trisulfonic acid.

Example 14
Preparation of:



400-700nm at 20nm spectral intervals, using illuminant C with a 2° (CIE 1931) observer angle and a density operation of status T.

Further Inks

The inks described in Tables A and B may be prepared wherein the Dye described in the first column is the compound made in the above Example of the same number. Numbers quoted in the second column onwards refer to the number of parts of the relevant ingredient and all parts are by weight. The inks may be applied to paper by ink-jet printing.

The following abbreviations are used in Tables A and B:

PG = propylene glycol
DEG = diethylene glycol
NMP = N-methyl pyrollidone
DMK = dimethylketone
IPA = isopropanol
MEOH = methanol
2P = 2-pyrrolidone
MIBK = methylisobutyl ketone
P12 = propane-1,2-diol
BDL = butane-2,3-diol
CET= cetyl ammonium bromide
PHO = Na_2HPO_4 and
TBT = tertiary butanol
TDG = thiodiglycol

TABLE A

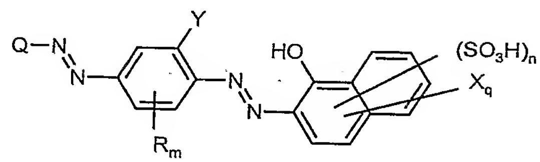
Example	Dye Content	Water	PG	DEG	NMP	DMK	NaOH	Na Stearate	IPA	MEOH	2P	MIBK
1	2.0	80	5		6	4					5	
2	3.0	90		5	5		0.2					
3	10.0	85	3		3	3				5	1	
4	2.1	91		8								1
5	3.1	86	5					0.2	4			5
6	1.1	81			9		0.5	0.5			9	
7	2.5	60	4	15	3	3			6	10	5	4
8	5	65		20					10			
9	2.4	75	5	4		5				6		5
10	4.1	80	3	5	2	10		0.3				
11	3.2	65		5	4	6			5	4	6	5
12	5.1	96								4		
13	10.8	90	5						5			
14	10.0	80	2	6	2	5			1		4	
15	1.8	80		5							15	
16	2.6	84			11						5	
1	3.3	80	2			10				2		6
1	12.0	90				7	0.3		3			
1	5.4	69	2	20	2	1					3	3
1	6.0	91			4						5	

TABLE B

Example	Dye Content	Water	PG	DEG	NMP	CET	TBT	TDG	BDL	PHO	2P	PI2
1	3.0	80	15			0.2					5	
2	9.0	90		5						1.2		5
3	1.5	85	5	5		0.15	5.0	0.2				
4	2.5	90		6	4					0.12		
5	3.1	82	4	8		0.3						6
6	0.9	85		10					5	0.2		
7	8.0	90		5	5			0.3				
8	4.0	70		10	4				1		4	11
9	2.2	75	4	10	3				2		6	
10	10.0	91			6						3	
11	9.0	76		9	7		3.0			0.95	5	
12	5.0	78	5	11							6	
13	5.4	86			7						7	
14	2.1	70	5	5	5	0.1	0.2	0.1	5	0.1	5	
15	2.0	90		10								
16	2	88						10				
1	5	78			5			12			5	
1	8	70	2		8			15			5	
1	10	80						8			12	
1	10	80		10								

CLAIMS

1. A compound of Formula (1) and salts thereof:



Formula (1)

wherein:

Q is an optionally substituted aryl ring;
Y is CO_2H, SO_3H or PO_3H_2;
R and X are substituents;
m is 0 to 3;
n is 0 to 6; and
q is 0 to 6.

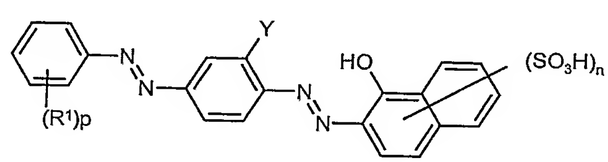
2. A compound according to claim 1 wherein Q is optionally substituted phenyl.

3. A compound according to either claim 1 or claim 2 wherein Q is phenyl bearing at least one CO_2H, SO_3H or PO_3H_2 substituent and optionally other substituents.

4. A compound according to any one of the preceding claims wherein Q is phenyl with 1 or 2 substituents independently selected from the group consisting of CO_2H, SO_3H or PO_3H_2.

5. A compound according to any one of the preceding claims wherein n is 1, 2 or 3.

6. A compound according to claim 1 of Formula (2);

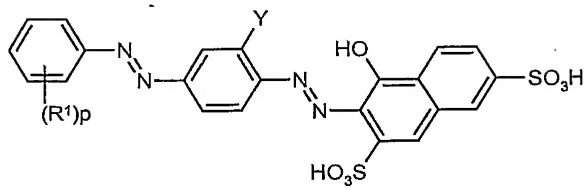


Formula (2)

wherein:

Y and R^1 independently are CO_2H, SO_3H or PO_3H_2;
p is 1 or 2; and
n is 1 to 3.

7. A compound according to claim 1 of Formula (3);



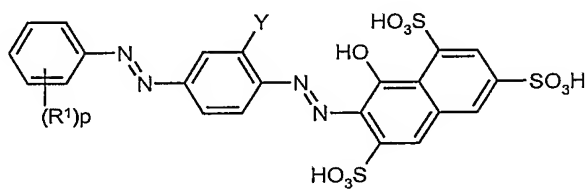
Formula (3)

wherein

Y and R^1 independently are CO_2H, SO_3H or PO_3H_2; and

p is 1 or 2.

8. A compound according to claim 1 of Formula (4);



Formula (4)

wherein

Y and R^1 independently are CO_2H, SO_3H or PO_3H_2; and

p is 1 or 2.

9. A compound according to any one of the preceding claims which is free from fibre reactive groups.

10. A composition comprising a compound as described in any one of claims 1 to 9 and a liquid medium.

11. A process for forming an image on a substrate comprising applying a composition according to claim 10 thereto by means of an ink-jet printer.

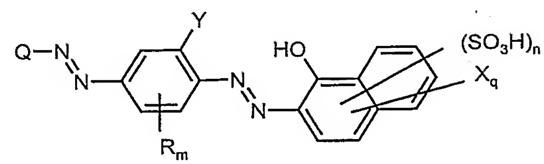
12. A substrate printed with a composition according to claim 10.

13. An ink-jet printer cartridge comprising a chamber and an ink wherein the ink is in the chamber and the ink is as described in claim 10.

ABSTRACT

COMPOUNDS AND INKS

A compound of Formula (1) and salts thereof:



Formula (1)

wherein:

Q is an optionally substituted aryl ring;

Y is CO_2H, SO_3H or PO_3H_2;

R and X are substituents;

m is 0 to 3;

n is 0 to 6; and

q is 0 to 6.

Also compositions comprising these compounds, ink-jet inks, an ink jet process and an ink-jet cartridge.